Chapter Five

Inventory of Potential Sources of Contamination

5.0 INVENTORY OF POTENTIAL SOURCES OF CONTAMINATION

Potential sources of contamination within wellhead or wellfield areas need to be inventoried, then managed, to prevent the contamination of ground water supplying the well(s) or spring(s). This chapter addresses the inventory aspect of wellhead protection.

The EPA has developed a technical assistance document called "Guide for Conducting Contaminant Source Inventories for Public Drinking Water Supplies" (1991). This document discusses the design, structure, and function of contaminant source inventories and can assist communities in addressing this component of the Wellhead Protection Program. It also offers a suggested inventory form and includes copies of forms that have been used by other states.

5.1 POTENTIAL SOURCES OF CONTAMINATION

The Idaho Wellhead Protection Work Group developed categories of potential sources of contamination based on a list developed by the EPA. In addition, these categories were supplemented with examples and related activities (Table 5.1). These categories were not assigned a relative risk. Instead, local governments should work with the various entities, discussed under "Responsibilities of the Water Purveyor and Local Government", in this chapter, to prioritize their sources. The potential sources of contamination list will be updated, as needed, by IDEQ.

Unregulated sources of contamination are included as supplemental information under the Examples/Related Activity heading. Additional information on unregulated sources of contamination can be found in the EPA Technical Assistance Document, "A Review of Sources of Ground Water Contamination from Light Industry."

5.2 INVENTORY RESPONSIBILITIES AND PROCEDURES

5.2.1 Responsibilities of the Water Purveyor and Local Government

Once wellhead protection areas have been delineated, the water purveyor and the local government need to compile and maintain an inventory of potential sources of contamination that are located in these areas. The source inventory information should be kept with the water purveyor and/or the local government and should be submitted to the entities involved with local emergency response activities.

Although the inventory of potential sources of contamination should include all sources (see Table 5.1), plans that are submitted to IDEQ for certification will at a minimum need to include an inventory of those sources that are primarily managed by state or federal agencies. Examples of these types of sources include underground storage tanks with greater than 1,100 gallon capacity, landfills, and land application sites. This information will assist IDEQ in coordinating protection efforts with other agencies or programs involved with ground water quality. Information on state or federally managed sources of ground water contamination and the associated administering agency(ies) is given in Table E-1 in Appendix E.

However, activities that are not regulated by the state or federal governments can cause an impact on ground water quality. Therefore, local governments and water purveyors are encouraged to compile an inventory that is as detailed as possible.

Table 5.1. Categories of Potential Sources of Contamination

CATEGORY I Sources designed to discharge substances	
Source	**Examples/Related Activity**
Injection Wells	♦ Class V injection wells (covered under state regulations); examples include: ♦ Agricultural return water disposal ♦ Urban runoff disposal ♦ Heat pump return wells ♦ Mining waste disposal ♦ Artificial recharge wells ♦ Municipal disposal wells (prohibited by state rules; include certain Class I injection wells.) ♦ Wells used for disposal of fluids associated with gas or oil production and wells which inject fluids for the extraction of minerals (prohibited by state rules; include Class II & III injection wells) ♦ Wells used to inject hazardous or radioactive wastes (prohibited by federal and/or state rules; include Class IV and certain Class I injection wells)
Land Application	♦ Municipal or industrial wastewater ♦ Municipal or industrial sludge or septage
Non-Waste	♦ Artificial recharge ♦ Enhanced steam recovery ♦ Geothermal discharge ♦ Ground water heat pump discharge
Subsurface percolation	♦ Cesspools ♦ Septic tanks ♦ Storm water drain fields ♦ Injection wells

Table 5.1 - Continued

CATEGORY II Sources designed to store, treat, and/or dispose of substances; discharge through unplanned release	
Source	**Examples/Related Activity**
Above ground storage tanks	♦ Chemical storage ♦ Fertilizer storage ♦ Fuel storage for homes and business ♦ Lubricant storage ♦ Pesticide storage ♦ Solvent storage ♦ Tank farms ♦ Transportation maintenance shops ♦ Waste or used material storage
Animal burial	♦ Animal burial
Containers of hazardous, non-hazardous, and non-waste materials	♦ Airports ♦ Appliance repair shops ♦ Automotive repair and body shops ♦ Beauty shops ♦ Boat builders and refinishers ♦ Chemical manufacturers ♦ Dry cleaners ♦ Electroplaters and metal fabricators ♦ Engine repair shops ♦ Fertilizer storage ♦ Furniture strippers and refinishers ♦ Health clinics ♦ Laboratories ♦ Leather manufacturers ♦ Machine shops ♦ Metal and drum cleaning or reconditioning ♦ Mortuaries ♦ Ore processors ♦ Paint shops ♦ Pesticide storage ♦ Photographic processors ♦ Plant nurseries ♦ Printers, blueprint shops ♦ Prisons ♦ Railroad yards ♦ Refrigeration shops ♦ Repair shops ♦ Rust proofing shops ♦ Textile and apparel producers ♦ Transportation maintenance shops ♦ Wood treatment facilities
Detonation sites	♦ Military facilities ♦ Ordnance disposal
Graveyards	♦ Human burial (embalming chemicals)

Table 5.1 - Continued

CATEGORY II Sources designed to store, treat, and/or dispose of substances; discharge through unplanned release	
Source	**Examples/Related Activity**
Landfills	♦ Industrial hazardous waste ♦ Industrial non-hazardous waste ♦ Municipal sanitary ♦ Non-municipal solid waste
Materials stockpiles	♦ Animal feed piles ♦ Battery storage ♦ Coal storage ♦ Fertilizer piles ♦ Junkyards ♦ Road salt storage ♦ Scrap yards
Open dumps	♦ Abandoned dumps ♦ Illegal dumps
Open burning sites	♦ Trash burning areas ♦ Pesticide container disposal ♦ Firefighter training sites
Radioactive disposal sites	♦ Federal facilities ♦ Mining wastes ♦ Preprocessing sites
Residential disposal	♦ Trash burning residue ♦ Waste oil disposal
Surface impoundments	♦ Food processing ♦ Industrial processing ♦ Sewage lagoons
Underground storage tanks	♦ Chemical storage ♦ Fertilizer storage ♦ Fuel storage for home or business ♦ Lubricant storage ♦ Pesticide storage ♦ Retail fuel facilities ♦ Solvent storage ♦ Tank farms/bulk storage areas ♦ Transportation maintenance shops ♦ Waste or used material storage
Waste tailings	♦ Acid mine drainage ♦ Mine tailings
Waste piles	♦ Asphalt and construction debris ♦ Agricultural wastes ♦ Animal wastes ♦ Community compost piles ♦ Food processing wastes ♦ Wood wastes

Table 5.1 - Continued

CATEGORY III Sources designed to retain substances during transport or transmission	
Sources	**Examples/Related Activity**
Materials transport or transfer	♦ Transfer stations ♦ Vehicles carrying hazardous materials or waste
Pipelines	♦ Geothermal lines ♦ Petroleum lines ♦ Sewer lines ♦ Slurry lines

CATEGORY IV Sources discharging substances as a consequence of other planned activities	
Source	**Examples/Related Activity**
Animal feeding operations	♦ Animal clinics ♦ Aquaculture ♦ Dairies ♦ Feedlots ♦ Kennels ♦ Poultry farms ♦ Race tracks ♦ Zoos
De-icing salt applications	♦ Airports ♦ Transportation corridors
Irrigation practices	♦ Agricultural return water
Mining	♦ Mine site runoff ♦ Ore processing by cyanidation
Percolation of atmospheric pollutants	♦ Acid rain
Pesticide and fertilizer applications	♦ Agriculture lands ♦ Cemeteries ♦ Demossing of irrigation canals ♦ Golf courses ♦ Lawns ♦ Parks ♦ Transportation corridors
Urban runoff	♦ French drains ♦ Infiltration basins ♦ Storm wells

Table 5.1 - Continued

CATEGORY V Sources providing a conduit or inducing discharge through altered flow patterns	
Source	**Examples/Related Activity**
Construction excavation	♦ Construction excavation
Other non-waste wells or borings	♦ Exploration wells ♦ Monitoring wells ♦ Test holes (geotechnical borings, such as soil characterization tests)
Production wells	♦ Oil and gas wells ♦ Geothermal or heat recovery wells
Water supply wells	♦ Improperly abandoned wells ♦ Improperly constructed wells ♦ Improperly operating chemigation systems/activities ♦ Contaminated wells
Utility Corridors	♦ Buried water and sewer line ♦ Buried communication lines ♦ Buried power lines ♦ Buried gas lines

CATEGORY VI Naturally occurring sources whose discharge is created and/or exacerbated by human activity	
Source	**Examples/Related Activity**
Gravel mining operations	♦ Gravel pit and rock quarries
Ground water and surface water interactions	♦ Dams (cause unnatural movement of surface water into ground water) ♦ Irrigation canals and drains
High total dissolved solids or salt water intrusion	♦ Increased pumping of shallow ground water can cause an upward movement of higher mineral content ground water into the shallow aquifer
Natural leaching	♦ Increased application of water in excess of natural precipitation can cause leaching

The water purveyor and the local government need to prioritize the potential sources based on relative risk and can obtain assistance from the following entities:

- ♦ Federal Agencies
- ♦ Health Districts
- ♦ Idaho Division of Environmental Quality

- Idaho Department of Health and Welfare, Division of Health, Office of Environmental Health
- Idaho Department of Agriculture
- Idaho Department of Water Resources
- Local Emergency Response Committee
- State Emergency Response Commission

5.2.1.1 Rationale/Discussion

The water purveyor and/or the local government need to compile and maintain their own inventory to manage their wellhead protection area(s).

All of the source inventory information is not required to be submitted to IDEQ because it would present data management problems and would be a burden on water purveyors/local governments to continually send updates on all sources. At a minimum, however, local plans that are submitted for certification should include an inventory of sources that are primarily managed by the state or federal governments. The source inventories should be updated as discussed under "Frequency of Inventory" in this chapter.

The categories of potential sources of contamination (Table 5.1) were not ranked with relative levels of risk for two main reasons. First, several so called low risk potential sources of contamination, such as septic systems, could create a high risk, if present in sufficient numbers. Secondly, relative risk is site specific; therefore, prioritizing source risks should be performed at the local level. It will be emphasized, however, that prioritizing the potential sources of contamination based on relative risk will be necessary when developing management strategies.

5.2.2 Responsibilities of the Lead Agency

IDEQ will help develop forms that can be used to assist local governments in conducting the source inventory. Water purveyors and local governments are encouraged to use an inventory form. IDEQ may also assist with the inventory process where requested.

5.2.2.1 Rationale/Discussion

A source inventory form will assist water purveyors and local governments in collecting the necessary information. Also it may assist IDEQ in managing the data, or may be useful to the drinking water monitoring program.

5.2.3 Frequency of Inventory

It is anticipated that over time the land uses within an established wellhead protection area will change. Therefore, the Wellhead Protection Work Group recommends that the source inventory within wellhead protection areas be updated after the initial inventory, using the following time frames:

- inventory within Zones IA and IB should be updated on a regular basis.
- inventory within Zones II, III, and recharge areas should be updated at least every two years.

Communities with certified plans should submit updated information on federal or state managed sources to IDEQ every two years. This will assist the agency in maintaining coordination with other programs and agencies.

5.2.3.1 Rationale/Discussion

The source inventory in Zones IA and IB should be updated on a continuous basis because these are the most vulnerable zones around the wellhead. The inventory in Zones II, III, and the recharge area also needs to be updated, but since the zones are further from the wellhead, the update is not as critical as in the two closer zones.

Chapter Six

Management of Potential Sources of Contamination

6.0 MANAGEMENT OF POTENTIAL SOURCES OF CONTAMINATION

The management of potential sources of contamination within wellhead protection areas is the crux and perhaps the most challenging component of the Wellhead Protection Program. Levels of management will typically vary for each of the zones within a wellhead protection area. There are numerous tools, both regulatory and non-regulatory, that can be and have been used to successfully manage wellhead protection areas in the country.

6.1 WELLHEAD PROTECTION AREA MANAGEMENT POLICIES

6.1.1 Duties

Local governments have the authority to manage potential sources of contamination within wellhead protection areas in their jurisdiction. The authorities for local governments to accomplish this component of wellhead protection are discussed under "Program Roles and Responsibilities," Chapter 3.

6.1.2 Management of the Wellhead Protection Area

In general, there should be an appropriate level of management throughout wellhead protection areas, with progressively more stringent management of land use and waste discharge closer to the wellhead.

The general management strategy policies for each zone within wellhead protection areas are shown in Table 6.1.

Communities that choose to use the refined exception delineation will need to develop management strategies that are consistent with effectively managing the smaller wellhead protection area. The zones for this delineation approach are discussed in detail under "Wellhead Protection Area Delineation," Chapter 4.

6.1.2.1 Rationale/Discussion

The primary purpose of subdividing wellhead protection areas into zones is to allow for management flexibility. The zones closest to the wellhead should be managed more stringently than those zones further away.

Table 6.1. Management Policies for the Zones of a Wellhead Protection Area

Zone	Management Policy
Zone IA: Sanitary setback distance for public drinking water wells.	♦ Prohibit all potential sources of contamination.
Zone IB: Minimum 3 year Time of Travel boundary.	♦ Implement more stringent management than in Zones II, III, or recharge areas. Use an appropriate mix of regulatory management tools, such as restricting or prohibiting some activities, in addition to non-regulatory management tools which should include public education and information. ♦ Source monitoring[1] is highly recommended.
Zone II: Minimum 6 year Time of Travel boundary.	♦ Implement an appropriate level of management using a mix of regulatory management tools, such as design and operating standards for those activities otherwise restricted within Zone IB, and non-regulatory management tools which should include public education and information. ♦ Source monitoring[1] is highly recommended.
Zone III: Minimum 10 year Time of Travel boundary.	♦ At a minimum, implement public education and information efforts.
Known recharge areas and flow boundaries.	♦ Implement an appropriate level of management. ♦ Source monitoring[1] is highly recommended.

[1]Source monitoring involves a regular evaluation of ground water quality around a potential source of contamination.

The management policies for the different zones have been selected for the following reasons:

Zone IA: Prohibition of all potential sources of contamination within the setback area of a well is required by the Idaho Rules Governing Public Drinking Water Systems.

Zone IB: Implementation of more stringent management than Zones II and III and source monitoring are recommended for this zone, because it is the surface area that most likely overlies the cone of depression. The cone of depression has a steeper hydraulic gradient toward the wellhead than the regional hydraulic gradient. Because the gradient toward the wellhead is steeper, a contaminant in the ground water in this area travels more quickly toward the wellhead than a contaminant release in the ground water in an area dominated by the regional hydraulic gradient, as in Zone II (Figure 6.1).

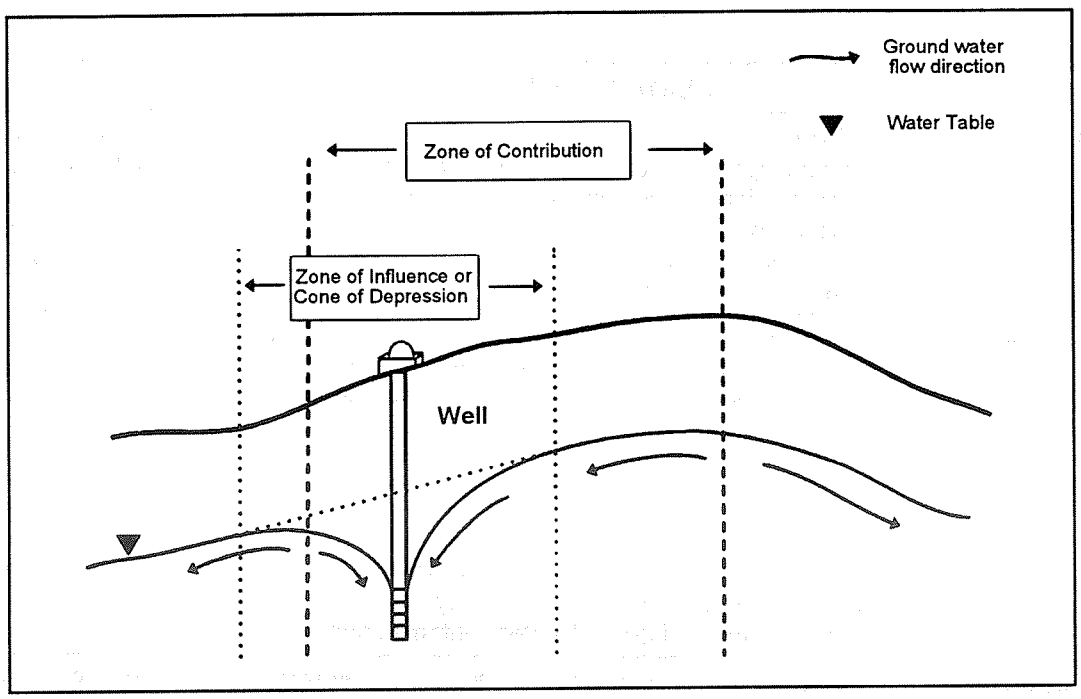
Zone II: This area needs to be managed by an appropriate level of stringency. It generally represents a portion of the area of contribution nearest the wellhead

that lies outside the cone of depression (Figure 6.1.) and most likely is dominated by the regional hydraulic gradient.

Zone III: At a minimum, this zone should be managed by public educational efforts as it also represents an area of contribution to the well.

Recharge Areas and Flow Boundaries:
Recharge areas should be appropriately managed to prevent ground water quality impacts. Ground water quality impacts from human activities in this zone can contribute to adverse water quality at the wellhead.

Figure 6.1 Conceptualized Ground Water Flow to a Pumping Well



6.2 MANAGEMENT TOOLS FOR WELLHEAD PROTECTION AREAS

There are both regulatory and non-regulatory tools that have been used to manage potential sources of contamination. These tools are listed and described within Table 6.2. Note that some management tools, such as ground water monitoring, can be applied in either a regulatory or non-regulatory framework. For further information, the reader can reference the EPA Technical Assistance Documents entitled "Tools for Local Governments" (1989) and "Local Financing for Wellhead Protection"(1989).

Examples of regulatory tools found within Table 6.2 include zoning ordinances, source prohibitions, design standards, and operating standards. Examples of non-regulatory tools

found within Table 6.2 include public education and information, hazardous waste collection, and pollution prevention. As noted, public education and information should be an important component of any wellhead protection program. Examples of public education and information activities include storm drain stenciling, providing workshops on waste stream minimization, notifying businesses and residents within wellhead protection areas, road signage, providing wastewater discharge workshops, implementing ground water contamination self assessment projects such as Home-A-Syst, initiating media interest in ground water protection, providing flyers and brochures on ground water protection issues, and incorporating ground water and wellhead protection education into the water/wastewater operator certification process.

Table 6.2 Management Tools for Wellhead Protection Areas

REGULATORY TOOLS	
Zoning Overlay	Overlay zones can be used in conjunction with conventional zoning and to create special districts to protect the wellhead protection area. Overlay zones are applied to areas singled out for special protection, such as the wellhead protection area itself, and add regulations to those controls already in place. This method helps address "grandfathered" potential contaminant sources in wellhead protection areas.
Zoning Ordinances	Zoning ordinances typically are comprehensive land-use requirements designed to direct the development of an area. Many local governments have used zoning to restrict or regulate certain land uses, which have the potential to contaminate ground water within wellhead protection areas.
Subdivision Ordinances	Subdivision ordinances are applied to land divided into two or more subunits for sale or development. Local governments use this tool to protect wellhead protection areas in which ongoing development is causing contamination. An example of a subdivision ordinance would be to require a minimum lot size for single family homes using septic systems so as to limit septic system density and subsequent ground water contamination.
Potential Source Prohibitions or Restrictions	Source prohibitions or restrictions are regulations that prohibit or place restrictions on the use of certain chemicals that pose a high risk to ground water contamination such as Atrazine or trichloroethene; or prohibit or place restrictions on the placement of some high-risk potential contaminant sources such as underground storage tanks, underground injection wells, lagoons, feedlots, and/or landfills.
Building Codes	Local building codes offer protection through special standards applicable to facilities which are remodeled or constructed in the wellhead protection area. Building codes can require low flow fixtures, backflow preventers and other design features to conserve and protect ground water.
Design Standards	Design standards typically are regulations that apply to the design and construction of buildings or structures. This tool can be used to ensure that new buildings or structures placed within a wellhead protection area are designed so as not to pose a threat to the water supply, such as requiring an impermeable liner on a settling pond.

Operating Standards	Operating standards are regulations that apply to ongoing land-use activities to promote safety or environmental protection. Such standards can minimize the threat to the wellhead protection area from ongoing activities such as the storage and use of hazardous substances through requirements such as secondary containment and spill response capabilities, or requiring that septic systems be properly maintained.
Site Plan Review	Site plan reviews are regulations requiring developers to submit for approval plans for development occurring within a given area. This tool ensures compliance with regulations or other requirements made within a wellhead protection area.
Bonding	Facilities may be required to post a bond prior to operation in a wellhead protection area. Bond can cover costs associated with spill response or remediation efforts.
Performance Standards	Performance standards are used to regulate development within wellhead protection areas by enforcing predetermined standards for water quality. They may be applied at a predetermined ground water monitoring compliance point, at the point of injection of stormwater runoff, or through the use of contaminant source modeling. One example is the requirement that the amount of stormwater runoff be the same before and after construction when developing or improving a site.
Special Permitting	Special permits are used to set conditions for certain uses and activities that pose a high risk to ground water contamination within wellhead protection areas if left unregulated. One example is to require that new feedlots within some of the wellhead protection area zones be required to have a city or county permit that may require ground water quality monitoring and/or the use of certain ground water protection management practices.
Transport Prohibitions	The transport of chemical compounds which pose a high risk to ground water quality if spilled can be restricted within a wellhead protection area by requiring alternative transportation routes.
NON-REGULATORY TOOLS	
Public Education and Information	Public education and information should be an important component of any wellhead protection program. Public education often consists of brochures, pamphlets, or seminars designed to present wellhead area problems and protection efforts. This tool promotes the use of voluntary protection efforts and builds public support for a community protection program.
Water Conservation Program	Implementing water conservation measures can significantly benefit wellhead protection efforts by reducing pumping rates. Lower pumping rates mean reduced flow rates and less risk of moving any contamination toward the wellhead. Conserving water may also help reduce the need for additional water sources in the near future. Water conservation can be accomplished through steps such as promoting the use of native vegetation, improved irrigation methods such as drip irrigation, and through public education.
Hazardous Waste Collection	Establishing a permanent location or holding one-day events to collect hazardous wastes from community residents (both small businesses and households) is a very effective way to reduce risks posed by storing hazardous wastes within the wellhead protection area. This would reduce the risk of improper disposal into septic systems not designed to handle such wastes or from improper disposal to the ground, and may also help protect a community's wastewater treatment plant from harmful chemicals.

Pollution Prevention	A pollution prevention program can include reducing the amount of chemical wastes or reducing the usage of certain chemicals by replacing them with chemicals that are less threatening to ground water quality. Pollution prevention is often accomplished through education and information, such as through the distribution of pollution prevention booklets specific to a type of source such as an automobile repair shop.
Purchase of Development Rights or Property	The purchase of property or development rights is a tool used by some localities to ensure complete control of land uses in or surrounding a wellhead protection area. This tool may be preferable if regulatory restrictions on land use are not politically feasible and the land purchase is affordable.
Spill Response Planning	Local governments can develop their own emergency spill response programs to minimize potential impacts of spills to ground water quality.
TOOLS THAT CAN BE REGULATORY OR NON-REGULATORY	
Best Management Practices (BMPS)	BMPS are practices or combination of practices which ultimately prevent or reduce contamination to ground water. Although often associated with agricultural activities, BMPS can apply to any activity that has the potential to impact ground water or surface water. BMPS can be encouraged through voluntary methods or can be required through regulations which may further define what a BMP is and how it is to be used.
Ground Water Monitoring	Ground water monitoring includes selecting appropriate sampling sites upgradient of the well and developing an ongoing water quality monitoring program. Monitoring can also be a regulatory requirement for high risk contaminant sources within a wellhead protection area.
Training and Demonstrations	These programs can complement many of the regulatory or non-regulatory tools. Examples include training of local emergency response teams or demonstration of agricultural BMPS.
Inspection Programs	Inspection of facilities and other contaminant sources can be developed as a voluntary program or through regulatory requirements. Voluntary inspection of businesses for pollution prevention and contaminant control ideas and recommendations is one example of a non-regulatory approach.

6.3 WELLHEAD PROTECTION AREA MANAGEMENT: AN EXAMPLE

To illustrate the zone management concepts and the application of various management tools to a potential source of contamination, the management strategies used by two fictitious communities are compared in Table 6.3. The example uses underground storage tanks as the potential source of contamination.

Some of the possible management strategies and tools specifically adapted to underground storage tanks include:

- implementation of new construction standards;
- installation of release detection and overflow prevention devices;
- bond or insure to cover costs associated with spill response or remediation;
- increased inspections/tank tightness testing;
- improved inventory control methods;

- corrosion protection of tank systems;
- installation of source monitoring;
- prohibition of the source; and
- public education and information pertaining to ground water quality risks and historical problems associated with leaking underground storage tanks.

Table 6.3 Examples of Zone Management Concepts

Zone	Community A Refined Approach	Community B Basic Approach
Zone IA	Prohibition of all underground storage tanks.	Prohibition of all underground storage tanks.
Zone IB	Implementation of new construction standards. Installation of release detection and overflow prevention devices. Improved inventory control methods. Public education and information.	Installation of release detection and overflow prevention devices. Increased inspection and tank tightness testing. Improved inventory control methods. Public education and information.
Zone II	Increased inspection and tank tightness testing. Improved inventory control methods. Public education and information.	Increased inspection and tank tightness testing. Improved inventory control methods. Public education and information.
Zone III	Increased inspection and tank tightness testing. Public education and information.	Public education and information.
Recharge Areas	Installation of source monitoring. Increased inspection and tank tightness testing. Improved inventory control methods. Public education and information.	

6.4 MULTI-JURISDICTION WELLHEAD PROTECTION AREAS

Ground water flow, thus wellhead protection areas, do not abide by political boundaries and therefore will not always be within one political jurisdiction. The State of Idaho anticipates that not only will wellhead protection areas cross city and county boundaries, but also will cross tribal and state boundaries.

In these situations, governmental entities will need to work cooperatively and can coordinate their efforts through a community planning team as discussed in Chapter 3 under "Community Planning Teams". Coordination mechanisms may also include letters

of agreement, memorandums of understanding, ordinances, comprehensive plans, and advisory groups.

6.5 WELLHEAD PROTECTION PROJECTS

There are several local wellhead protection projects in Idaho which are in various phases of development.

6.5.1 Rural Communities

The Idaho Rural Water Association has been offering technical assistance to rural communities that are interested in implementing wellhead protection. As of December 1994, 37 rural communities had accepted this offer. Some of these communities are now examining wellhead protection ordinances from other towns and cities in the nation and are deciding whether they can use these ordinances as they are or if they will need modification. Several of these communities have assisted in the development of the Idaho Wellhead Protection Plan.

A joint wellhead protection project for two neighboring communities, Newport, Washington and Oldtown, Idaho (West Bonner Water District) has formally been in progress since 1992. The project has been funded through the Washington Centennial Clean Water Funds and through a contract with IDEQ. These communities are developing a wellhead protection plan for their springs and wells.

6.5.2 Urban Communities

In fall of 1991, the City of Boise was awarded a wellhead protection demonstration grant from the EPA. Boise has been working on several aspects of a local wellhead protection program, such as education, source inventory, source management, coordinating wellhead protection into existing city programs, and supporting a study to compare the basic wellhead protection area with a computer modeled refined protection area. In addition, the City of Boise has very actively participated in the development of the Idaho Wellhead Protection Plan.

The City of Pocatello was awarded a wellhead protection demonstration grant from the EPA in 1992. Pocatello is working in cooperation with the Idaho Geological Survey to characterize the aquifer in greater detail to delineate refined wellhead protection areas. In addition, they will inventory past, present, and potential sources of contamination and will evaluate the findings to develop appropriate management tools. Representatives

from Pocatello have also participated in the development of the Idaho Wellhead Protection Plan.

6.5.3 Communities Involved with Aquifer Protection

In Northern Idaho, several entities have been implementing protective measures over the Rathdrum Prairie Aquifer primarily through grants from the EPA. These entities include IDEQ and the Panhandle District Health Department, in cooperation with Kootenai County and cities over the aquifer. The federal funds are shared with the State of Washington.

Kootenai County is currently developing, with financial assistance from IDEQ and the Panhandle District Health Department, sections of a comprehensive plan that target the protection of both the aquifer and its critical recharge areas. Subsequent land use ordinances to protect the aquifer are anticipated.

The entities involved in this aquifer/wellhead protection program have also worked together to implement local regulatory protection measures addressing sources such as sewage management and critical materials storage. Public education is an important component of the program and they have produced newsletters, worked with local community groups on aquifer related projects, and given numerous presentations on aquifer protection.

Chapter Seven

Contingency Plans

7.0 CONTINGENCY PLANS

Contingency plans need to address the location and provision of alternate drinking water supplies in the event of loss due to contamination or drought.

The EPA Technical Assistance Document called "Guide to Ground Water Supply Contingency Planning for Local and State Governments" (1990) provides valuable information to assist both local and state governments in establishing, maintaining, and updating emergency response procedures in the event of a loss of public water supplies.

7.1 LOCAL CONTINGENCY PLANS

7.1.1 Lead Entity

The water purveyor and/or the local government should be responsible for developing a local contingency plan. Contingency planning should be in cooperation with the community planning team and with advice from IDEQ and the district health departments.

7.1.1.1 Rationale/Discussion

The water purveyor should be involved with the development of a contingency plan because most of the relevant information and responsibilities currently resides with this entity as established by the Idaho Rules Governing Public Drinking Water Systems. Examples of these existing responsibilities are monitoring, record keeping, reporting, and public notification.

7.1.2 Incorporation of Contingency Plans into Other Local Plans

Local contingency plans should be included in the Local Emergency Response Committee plan. In addition, the contingency plan should be distributed to agencies/entities involved with local emergency plans, local planning officials, regulatory agencies, and district health departments.

7.1.2.1 Rationale/Discussion

The authority for local emergency response to a chemical release has been established by the Idaho Hazardous Substance Response Act, Idaho Code, Title 39, Chapter 71 and by the Federal Emergency Planning and Community Right-To-Know Act of 1986, also known as Superfund Amendments and Reauthorization Act, Title III. Because Local Emergency

Planning Committees are required to develop emergency response plans for their communities in the event of a chemical release, it follows that a contingency plan that addresses the contamination of drinking water should also be included.

7.1.3 Local Contingency Plan Implementation

Local contingency plans should be implemented when there is a drinking water violation(s) as defined by the Idaho Rules Governing Public Drinking Water Systems. These plans should be implemented quickly when there are violations of acute contaminants, such as bacteria and nitrate.

In addition, local contingency plans should be readied for implementation if a potential loss of water supply is indicated. The use of Maximum Contaminant Levels (MCLs), trends, and health advisories are recommended to plan contingency implementation actions.

To determine trends, the water purveyor should coordinate with IDEQ and/or the district health departments to interpret monitoring results and also should use information from the Environmental Data Management System (EDMS) which is housed at the IDWR. These interpretations and monitoring results should be shared with other drinking water systems in the area.

7.1.3.1 Rationale/Discussion

Not only should contingency plans be implemented when there is a violation in the drinking water standards, but plans should also be readied for implementation if there is an indication of the potential loss of a water supply. The evaluation of monitoring results, to determine trends or for comparison with MCLs or health advisory levels, will be a useful method to track the development of a potential problem of concern to the public. This information should be shared with other water purveyors in the area, as a contamination problem may impact other systems.

7.2 RECOMMENDED TOPICS IN A LOCAL CONTINGENCY PLAN

Since the State Emergency Plan can only be activated under special conditions, emergency response related to loss of drinking water supplies is primarily the responsibility of the water purveyor and local government. Table 7.1 lists the topics that should be addressed by a local contingency plan.

Table 7.1. Local Contingency Plan Topics

Topic	Recommended Approach
Water system characteristics	♦ Compile current plans and specifications showing the location of all components (source, treatment, distribution and type piping, valves, storage tanks, etc.) ♦ Assess component sizes and capabilities. ♦ Assess system use demands.
Identification of potential emergency situations	♦ Identify potential disruptive events such as contamination, power outage, flood, earthquake, water shortage, loss of pressure, etc.
General response procedures for each emergency situation.	♦ Develop incident assessment guidance to determine the severity and appropriate response to a particular emergency. ♦ Develop step-by-step procedures to be followed in response to a particular emergency. Include a list of names and phone numbers for all federal, state, and local officials that need to be contacted. ♦ Develop guidance on the level of service to be sustained during an emergency and prioritize the uses. This guidance should involve the curtailment of all non-drinking water related activities. ♦ Develop a procedure by which the system users will be notified of the extent of the emergency, actions being initiated, and precautions to be taken. ♦ Assess equipment and manpower needs for specific situations. Assess in-house capabilities to respond and identify additional sources of assistance which may be needed. ♦ Identify funding source(s).
Response procedure for emergency contingency plans. (Emergency contingency plans should cover the time period of 1-2 months following the loss or potential loss, as indicated by trends and health advisories, of a water supply.)	♦ Develop a problem identification procedure. ♦ Develop procedures to provide emergency water supplies[1]. ♦ Identify funding sources. Recommend using readily available resources.
Response procedure for short term contingency plans. (Short term contingency plans should cover the time period of up to 2 years following the loss or potential loss of a water supply.)	♦ Develop a problem identification procedure. ♦ Develop procedures to implement interim solutions[2]. ♦ Identify funding sources[3].

Table 7.1 Continued

Topic	Recommended Approach
Response procedure for long term contingency plans. (Long term contingency plans should cover the time period required to implement a permanent solution for the loss of a water supply.)	♦ Develop a problem identification procedure. ♦ Develop procedures to implement long term solutions. Long term solutions may involve development of alternative sources of drinking water or water treatment. ♦ Identify funding sources[3]. ♦ Develop a procedure for ongoing assessment of the situation and for documentation of all actions taken in regard to the incident. This will be important for enforcement actions. ♦ Begin implementation of the contingency plan to the extent possible before an emergency[4]. ♦ Provide for annual review and possible updating of contingency plans.

[1] Examples include bottled water, use of boil orders, use of surface water, state actions from the Bureau of Disaster Services. The Bureau of Disaster Services is responsible for coordinating the response, recovery, and mitigation operations of all state agencies during a disaster and coordinates all requests from local governments for disaster assistance.

[2] Examples include water conservation measures, replacement of equipment, connection to an adjacent system, and rehabilitation of an abandoned well.

[3] Examples include community block grants (U.S. Department of Commerce or the Idaho Department of Commerce), Farmers Home Administration, bonding, Idaho Legislature, or the Idaho Water Resource Board (Revolving Development Account or Water Management Account).

[4] Examples of pre-emergency actions include finalizing administrative agreements, developing engineering plans, having specification plans reviewed and approved, proceeding on construction, etc.

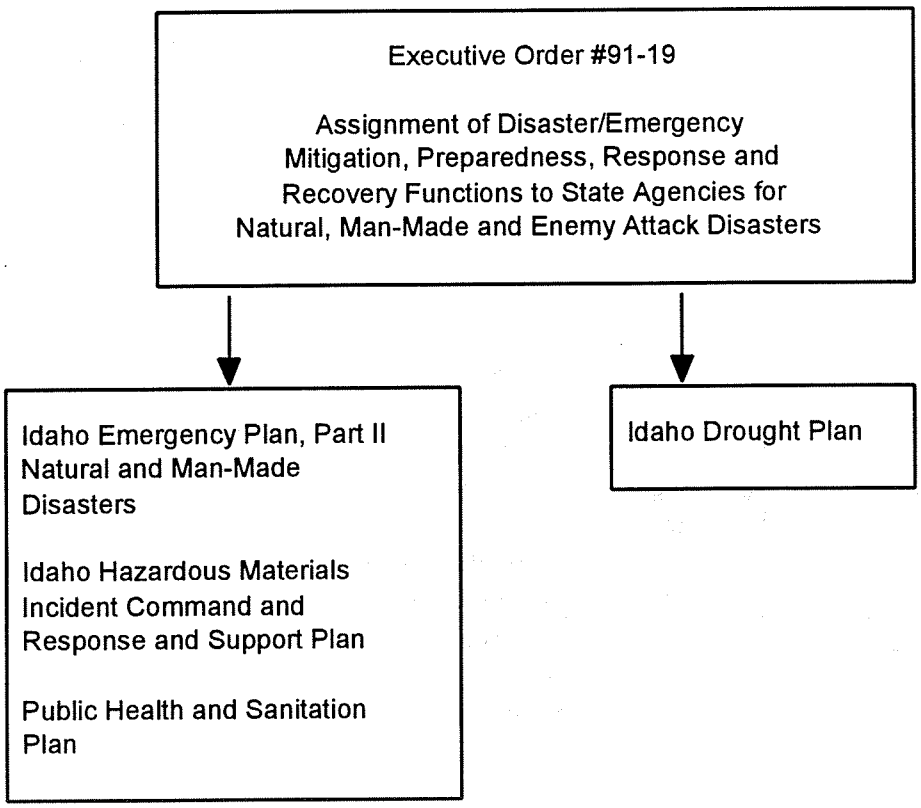
7.3 STATE EMERGENCY PLAN

7.3.1 Relevant State Emergency Plans

The Idaho Hazardous Materials Incident Command and Response Support Plan and the Public Health and Sanitation Plan are annexes to the Idaho Emergency Plan, Part II, Natural and Manmade Disasters. The Idaho Drought Plan has been developed by the Idaho Water Resource Board as appointed by the Governor. The authority for these disaster plans is Executive Order #91-19, Assignment of Disaster/Emergency Mitigation, Preparedness, Response and Recovery Functions to State Agencies for Natural, Man-Made and Enemy Attack Disasters (Figure 7.1).

The primary purpose of the Hazardous Materials Incident Command and Response Plan is to provide effective, coordinated emergency response support to local governments for incidents involving the release or potential release of hazardous materials. This plan may be activated independent of the Idaho Emergency Plan and can be initiated at the request of local governments when their capabilities have been exceeded. Qualifications and procedures to receive state and/or federal assistance is discussed in Annex M of the Idaho Emergency Plan, Part II.

Figure 7.1 State Emergency Plans Relevant to the Idaho Wellhead Protection Program



The purpose of the Idaho Drought Plan is to provide current and historic information, guidance, and a framework for managing future water shortage situations. Although the plan addresses loss of water supply due to drought, the Director of the Idaho Department of Water Resources can, at his/her discretion, activate the plan for other reasons, such as loss of water supply due to contamination. (Anderson, 1992).

Responsibilities of agencies that pertain or could pertain to drinking water emergencies, as designated under the Idaho Hazardous Materials Incident Command and Response Support Plan and/or Public Health and Sanitation Plan and/or the Idaho Drought Plan, are listed in the following tables.

Table 7.2. State Agencies with Relevant State Emergency Plan Roles

State Agencies	
Agency	**Roles**
Department of Agriculture	♦ Provide technical information on pesticides, herbicides, fertilizers, and other agricultural chemicals used in Idaho.
Department of Fish and Game	♦ Act as auxiliary police in the event of a major disaster.
Department of Health and Welfare - Division of Environmental Quality	♦ Assess and evaluate incident environmental risks. ♦ Forewarn users of potentially affected public domestic water systems. ♦ Coordinate environmental investigation and monitoring programs. ♦ Oversee the cleanup and disposal of hazardous wastes, radioactive wastes, and other deleterious materials.
Department of Health and Welfare - Division of Health	♦ Assist in providing technical and health services in the event of a major disaster.
INEL Oversight Program	♦ Advise agencies in the cleanup and disposal of radioactive wastes. ♦ Direct and coordinate investigations and assess risk to the public from radiation incidents.
Department of Law Enforcement - Idaho State Police	♦ Provide law enforcement actions related to a hazardous materials incident.
Public Utilities Commission	♦ Review costs and assist water companies with implementation of corrective actions.
Transportation Department	♦ Assist in providing materials for the containment of hazardous materials.
Department of Water Resources	♦ Assist in the development of emergency or alternate drinking water sources. ♦ Responsible for the Idaho Drought Plan, which includes information on federal and state drought-related and emergency assistance programs.
Executive Office of the Governor-Idaho Emergency Response Commission	♦ Provide technical assistance to local emergency planning committees. ♦ Administer the Idaho Regional Hazardous Materials Response Teams.
Executive Office of the Governor-Bureau of Disaster Services	♦ Coordinate state activities when a state disaster declaration is imminent or declared. ♦ Coordinate all requests for National Guard Support.
Executive Office of the Governor-Idaho National Guard	♦ Assists in providing emergency drinking water sources.
District Health Departments	♦ Forewarn users of potentially affected individual and public domestic water systems under the jurisdiction of the District Health Departments.

Table 7.3. Federal/other Entities with Relevant State Emergency Plan Roles

Federal Agencies	
Agency	**Roles**
Agriculture Department	♦ Has jurisdiction over the National Forest System lands in Idaho.
Department of Defense	♦ Act as the lead response agency within designated National Security areas.
Department of the Interior	♦ Has jurisdiction over the National Park System, National Wildlife Refuges and Fish Hatcheries, Department of Interior public lands, and certain water projects in western states.
Environmental Protection Agency	♦ Initiates containment and cleanup activities, at the request of the state, when the responsible party is unable or unwilling to initiate a cleanup. ♦ Provide environmental response and support, as requested by local or state personnel, to significant spills of hazardous materials.
U.S. Bureau of Reclamation	♦ Administers the Small Reclamation Projects Act Loan Program, Distribution System Loans Act Loan Program, which provides loans for projects that include municipal water supplies.
U.S. Army Corps of Engineers	♦ Provide emergency water supplies when all other reasonable means have been exhausted, during a drought.
National Weather Service	♦ Disseminate to the public and mass news media both weather and other civil emergency response messages when conditions pose an immediate threat to human life and property.
Other Entities	
Indian Nations	♦ Have sovereign powers within federally recognized reservations and will respond to incidents that occur on their reservations. The state will respond if requested by the Indian tribes. ♦ Indian tribes must notify the Emergency Medical Services of incidents that occur on reservations but may impact populations or the environment outside the reservation.

7.4 A DRINKING WATER CONTAMINATION CASE STUDY

The following incident is an example of the difficulties encountered during resolution of a drinking water contamination problem when a contingency plan is not in place. A mobile home park in Idaho was faced with the loss of its water supply because of ground water contamination discovered in June 1990. There were 50 connections affected by the loss of this water supply. This section is a chronological documentation of the actions taken to come to a long-term solution to this problem. If the mobile home association had a contingency plan, this event would have been less disruptive and solved much more quickly.

June 1990 Tetrachloroethylene was discovered in the drinking water well at a concentration greater than 100 parts per billion (ppb).

July 1990 Tetrachloroethylene was detected in the drinking water well at a concentration of 134 ppb. IDEQ confirmed the contamination problem and recommended continuation of the boil water advisory.

Sept. 1990 News release by the Department of Health and Welfare reported that the state would study the contamination problem around the mobile home park.

Dec. 1990 Tetrachloroethylene was detected in the drinking water well at a concentration of 144 ppb.

April 1991 The mobile home park was notified by IDEQ that their water system was disapproved because the levels of tetrachloroethylene were almost double the unreasonable risk to health limit of 70 ppb. The proposed MCL for tetrachloroethylene of 5 ppb was issued by EPA on January 1991.

May 1991 A meeting with mobile home park residents and IDEQ was held to discuss the problem. The residents were reluctant to correct the problem because of the cost; therefore, the EPA, in cooperation with IDEQ, drafted an emergency order. This order called for a plan to be submitted within two weeks that required several provisions: (1) alternative potable water to residents; (2) issuance of a public notice within 72 hours; (3) provisions related to treatment, monitoring, reporting, etc.; and (4) issuance of penalties for non-compliance.

Three possible long term solutions were recommended by the EPA: (1) drill a new well or deepen the existing well; (2) treat the water at the existing source; or (3) hook-up to a nearby water system.

A group of park residents considered the costs of various options and decided to hook up to a nearby water system.

Sept. 1991 The water purveyor completed construction.

Jan. 1992 One of the companies that caused the contamination, as part of a consent order, agreed to reimburse the park residents for the hook-up costs. In addition, the company agreed to pay the first year water bills for the residents.